Modeling PVT properties of crude oil systems using type-2 fuzzy logic systems

Introduction:

This paper presented a prediction model of Pressure-Volume-Temperature (PVT) properties of crude oil systems based on type-2 fuzzy logic systems. PVT properties are very important in the reservoir engineering computations, and its accurate determination is important in the primary and subsequent development of an oil field. Earlier developed models are confronted with several limitations especially in uncertain situations coupled with their characteristics instability during predictions. In this paper, an interval type-2 fuzzy logic based model is proposed and implemented to improve PVT properties predictions. Comparative studies have been carried out and empirical results show that the newly proposed approach outperforms others in general and particularly in the area of stability, consistency and the ability to adequately handle uncertainties. Another unique advantage of the proposed model is its ability to generate prediction intervals without extra computational cost.